

CLAIMS:

1. A composition comprising polydisperse aminodextran polymer molecules, said composition being soluble in an aqueous solution at a concentration of 10 mg/ml, said molecules having a narrow size distribution characterized by an average molecule mean hydrodynamic diameter of greater than 115 nm, a polydispersity index of between 0.10 and 0.47, an average molecular weight (MW) greater than 3 million daltons, and an amine content of greater than 50 amines per molecule.
2. The composition according to claim 1, wherein said average MW is greater than 4 MDa.
3. The composition according to claim 1, wherein said average MW is greater than 5 MDa.
4. The composition according to claim 1, wherein said average MW is greater than 6 MDa.
5. The composition according to claim 1, wherein said average MW is greater than 7 MDa.
6. The composition according to claim 1, wherein said average MW is greater than 8 MDa.
7. The composition according to claim 1, wherein said amine content is between 50 to 130 amines per molecule.
8. The composition according to claim 8, which is soluble in an aqueous solution at a concentration of between 10 to 50 mg/ml.

9. The composition according to claim 1, wherein said average molecule mean hydrodynamic diameter is greater than 125 nm.

10. The composition according to claim 1, wherein said average molecule mean hydrodynamic diameter is greater than 150 nm.

11. The composition according to claim 1, prepared by separating from a first mixture of polydisperse aminodextran particles of a wide size distribution characterized by an average molecule mean hydrodynamic diameter of less than 115 nm, and a polydispersity index greater than 0.40, a second mixture of polydisperse aminodextran polymer molecules having a narrow size distribution characterized by an average molecule mean hydrodynamic diameter of greater than 115 nm, a polydispersity index of between 0.10 and 0.47, an average molecular weight (MW) greater than 3 million daltons, and an amine content of greater than 50 amines per molecule, wherein said second mixture of separated molecules is soluble in an aqueous solution at a concentration of 10 mg/mL.

12. The composition according to claim 11, wherein said separating is performed by fractionation.

13. The composition according to claim 10, wherein said fractionation is performed using column chromatography.

14. A composition comprising a conjugate comprising the soluble polydisperse aminodextran molecules of claim 1, conjugated to a selected labeled protein.

15. The composition according to claim 14, wherein said labeled protein is a fluorescent protein or a protein labeled with a fluorescent protein.

16. The composition according to claim 15, wherein said fluorescent-labeled protein is an antibody labeled with a fluorescent molecule or dye.

17. A cell labeling reagent comprising a composition comprising polydisperse aminodextran polymer molecules, said composition being soluble in an aqueous solution at a concentration of 10 mg/mL, said molecules having a narrow size distribution characterized by an average molecule mean hydrodynamic diameter of greater than 115 nm, a polydispersity index of between 0.10 and 0.47, an average molecular weight (MW) greater than 3 million daltons, and an amine content of greater than 50 amines per molecule, wherein said molecules are conjugated via said amines to selected labeled proteins.

18. The reagent according to claim 17, wherein said labeled protein is an antibody labeled with a fluorescent molecule or dye.

19. A method for producing cell labeling reagents comprising the steps of:

- (a) providing a composition containing polydisperse aminodextran polymer molecules, said composition being soluble in an aqueous solution at a concentration of 10 mg/mL, said molecules having a narrow size distribution characterized by an average molecule mean hydrodynamic diameter of greater than 115 nm, a polydispersity index of between 0.10 and 0.47, an average molecular weight (MW) greater than 3 million daltons, and an amine content of greater than 50 amines per molecule; and
- (b) conjugating said molecules via said amines to selected labeled proteins.

20. The method according to claim 19, further wherein said providing step (a) further comprises the steps of:

- i. separating from a first mixture of polydisperse aminodextran particles of a wide size distribution characterized by an average molecule mean hydrodynamic diameter of less than 115 nm, and a polydispersity index greater than 0.4, a second mixture of polydisperse aminodextran polymer molecules having a narrow size distribution characterized by an average molecule mean hydrodynamic diameter of greater than 115 nm, a polydispersity index of between 0.10 and 0.47, an

average molecular weight (MW) greater than 3 million daltons, and an amine content of greater than 50 amines per molecule, wherein said second mixture of separated molecules is soluble in an aqueous solution at a concentration of 10 mg/ml;

- ii. lyophilizing said composition (i); and
- iii. redissolving said lyophilized composition in an aqueous solution.

21. A method for preparing an improved aminodextran composition comprising the step of:

separating from a first mixture of polydisperse aminodextran particles of a wide size distribution characterized by an average molecule mean hydrodynamic diameter of less than 115 nm, and a polydispersity index greater than 0.40, a second mixture of polydisperse aminodextran polymer molecules having a narrow size distribution characterized by an average molecule mean hydrodynamic diameter of greater than 115 nm, a polydispersity index of between 0.10 and 0.47, an average molecular weight (MW) greater than 3 million daltons, and an amine content of greater than 50 amines per molecule, wherein said second mixture of separated molecules is soluble in an aqueous solution at a concentration of 10 mg/ml.

22. The method according to claim 21, further comprising the steps of lyophilizing said separated composition; and redissolving said lyophilized composition in an aqueous solution.

23. The method according to claim 21, wherein said separating step comprises fractionating said first mixture over a chromatographic column and collecting and pooling selected chromatographic fractions corresponding to said aminodextran molecules of said narrow size distribution eluting from said column.